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# Youth Smoking in the Country and in the Military: Findings and Ideas

Aline O. Quester

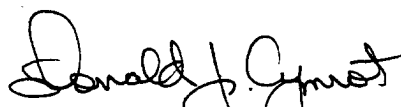
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# Youth Smoking in the Country and in the Military: Findings and Ideas

Dr. Aline Quester  
The Center for Naval Analyses  
January 1999

## The Problem

- Of all people alive today, 1/2 billion will die prematurely from use of tobacco
- 50 million Americans smoke
- After 25 years of decline, youth smoking in the U.S. is now on the rise

It is this last point -- the rise in youth smoking -- that has gripped the country. Let's start with a quick review of smoking in the country and smoking in the military.

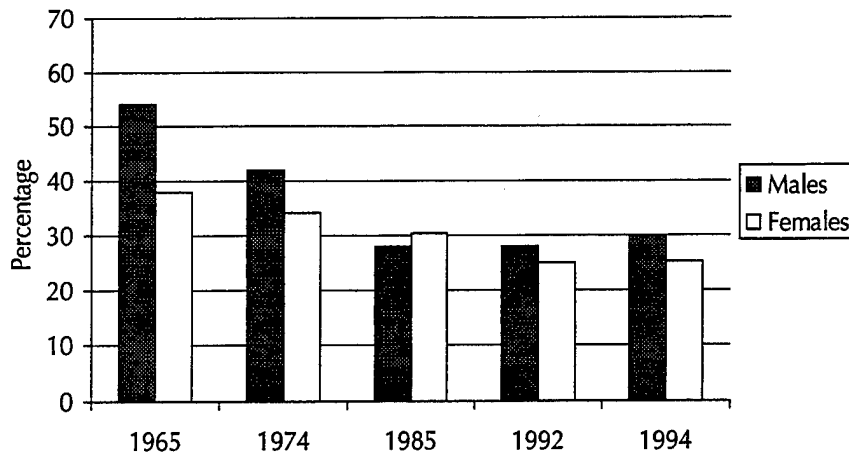
## U.S. Surgeon General's Report: 1964

- Initiate campaign against tobacco use
- Policies / strategies
  - Restrictions on advertising
  - Anti-smoking public service announcements
  - Education programs
  - Higher taxes
  - Smoking bans in public places
  - Lower insurance costs for non-smokers

The Surgeon General's Report in 1964 initiated a big public health campaign directed at reducing tobacco use using two general types of strategies:

- Educational/informational
  - The first three policies/strategies listed above illustrate various types of these approaches
- Economic
  - The last three policies/strategies involve raising the costs of smoking. The increase in costs can be either monetary or non-monetary.

## U.S. Current Smokers: 18-24 Years



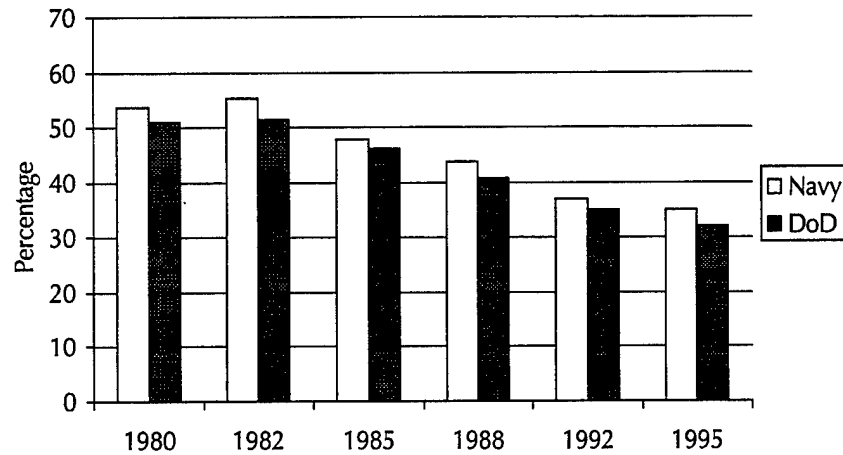
Source: National Center for Health Statistics, *Health, United States, 1996-7*, Hyattsville, MD: Public Health Service, p. 182, 1997

In this slide we look at the proportion of Americans aged 18 to 24 who are current smokers. From 1965 to 1994, the proportion declined substantially. The sharpest decreases are found for males: 55 percent of males smoked in 1965, falling to 30 percent by 1994. While females in this age group have also reduced their smoking (38 percent to 25 percent), the reduction is not as large. Differences in smoking behavior by gender have narrowed considerably over the period.

Comparing the 1992 and 1994 data, one can see a small increase in the percentage of smokers. Most of the press attention on youth smoking, however, has focused on teenagers.

The next slide details smoking percentages in the military. Our military data series begins in 1980, when the smoking percentage for the country was about 30 percent for this age group.

### Navy and Total DoD: Any Cigarette Use in Past 30 Days

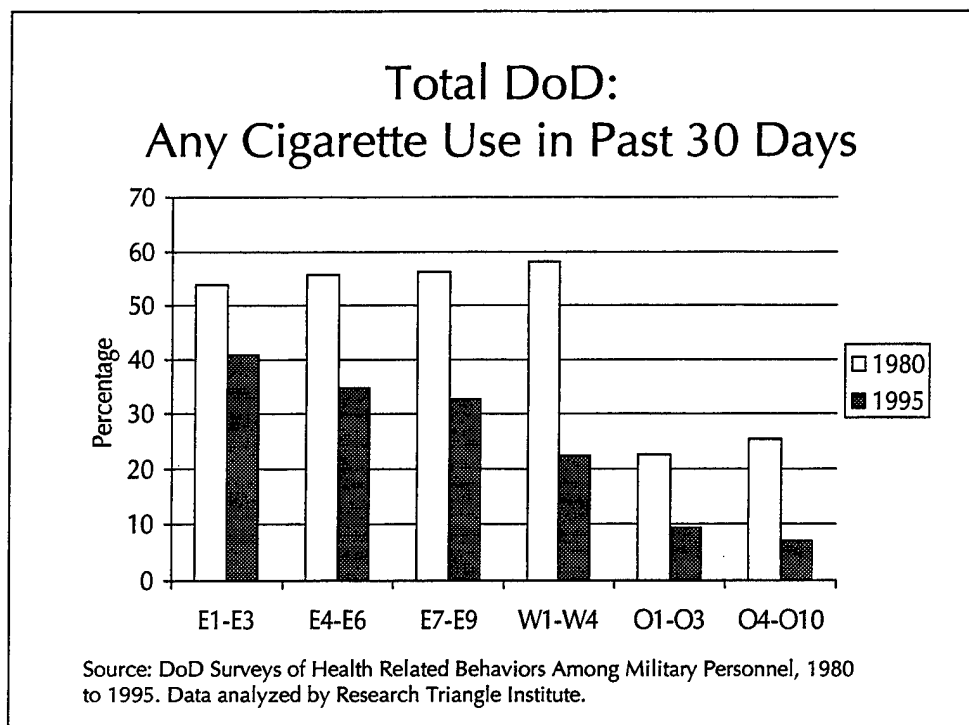


Source: DoD Surveys of Health Related Behaviors Among Military Personnel, 1980 to 1995. Data analyzed by Research Triangle Institute.

In 1980 smoking rates were about 20 percentage points higher in the military than they were in the country overall. From about the mid-1980s the military began to wage a more serious war against tobacco use, and smoking percentages have come down sharply since then.

Navy smoking rates are higher than the overall DoD rate. The Air Force has considerably lower rates of tobacco use than do the other services. Rates in the Army, Navy, and Marine Corps are fairly similar.





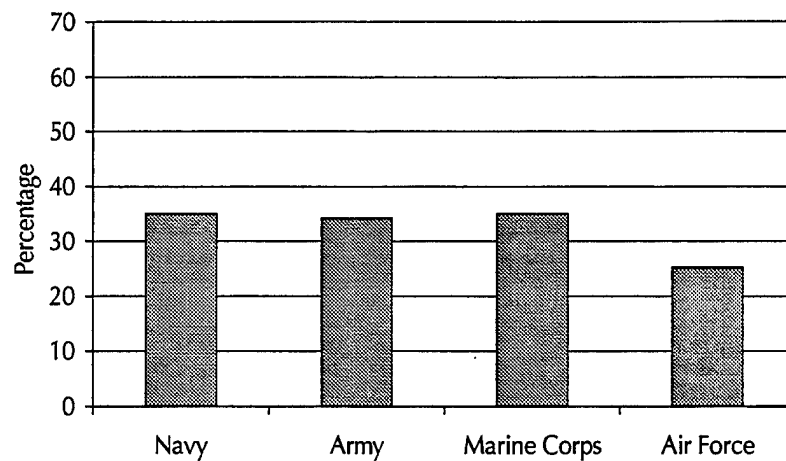
Here we compare the smoking rates, by grade, in 1980 and in 1995.

Looking first at 1980, we see that about 55 percent of enlisted personnel, regardless of grade, smoked. Smoking rates were even higher for warrant officers. Smoking rates were considerably lower for commissioned officers, but they increased by grade.

By 1995 the pattern had changed considerably. Except for the junior enlisted personnel, smoking percentages in general have been cut in half. The sharp decrease for warrant officers is particularly impressive. In contrast to 1980, there is variety in smoking rates by grade for enlisted personnel, with the chiefs smoking considerably less than the more junior personnel. For officers, the smoking percentage also declines by grade.

To get another benchmark on these sharp changes, compare the smoking rates of E7-E9s in 1995 with the smoking rates of E1-E3s in 1980 (remembering that the senior personnel in 1995 were the junior personnel in 1980). While some smokers have certainly left the Navy in this 15-year period, the quit rate for our current group of senior enlisted personnel has been quite impressive.

## Any Cigarette Use in Past 30 Days, 1995



Source: DoD Surveys of Health Related Behaviors Among Military Personnel, 1980 to 1995. Data analyzed by Research Triangle Institute.

This slide compares smoking behavior in the four services. The smoking percentage is quite similar in the Navy, Army, and Marine Corps. Considerably smaller percentages of Air Force personnel smoke.

## In the 1990s, CDC Reports Youth Smoking on the Increase

- Center for Disease Control's Youth Risk Behavior Survey shows past-month smoking for high school students
  - 27 percent in 1991
  - 36 percent in 1997
- Also see increases in 18- to 24-year-old population

After 25 years of decline, youth smoking has been on the rise in the 1990s. This problem has gripped the country. As yet, there have been no clear explanations for why youth smoking proportions have increased so sharply.

## Smoking

- What is the definition?
  - “Current smoker” (NCHS)
    - Also definition changed somewhat in 1992
  - Number of packs per day
  - Anytime in last 30 days
  - Pack-years
  - Never smoker, ex-smoker, experimental-smoker, regular smoker
  - Insurance forms: do you smoke?
- Exactly the same question is clearly most comparable

Different survey questions have been used to identify smoking behavior. We list most of them here. Perhaps the only question that is not self-explanatory is “pack-years” -- the number of packs per day times the number of years the individual has smoked.

The Air Force has used the categorization of never smoker, ex-smoker, experimental-smoker, and regular smoker. Only regular smokers are asked the pack-per-day questions. We believe this is a particularly good set of questions for young smokers, because it is both clear and provides some information on smoking histories.

If one is to make comparisons of the smoking behavior of different groups, it is clearly preferable to ask both groups the same question.

## Smoking Behavior: Navy vs. Civilians

- Research Triangle Institute provides comparisons standardized for sex, age, education, race/ethnicity, and marital status
  - 1994 data for civilians and 1995 data for Navy
  - Smoking in the last 30 days
- Navy shows higher rates than civilians
  - 18 to 25 years of age
    - 39% Navy and 36% civilian
  - 26 to 55 years of age
    - 34% Navy and 28% civilian

How does the smoking behavior of sailors compare with the smoking behavior for all civilians? The best analysis we found was one by the Research Triangle Institute. Questionnaires in 1994 and 1995 asked the same question (smoking in the last 30 days) of Navy and civilian personnel. Analysts at Research Triangle Institute then standardized the civilian data, making them comparable to the demographic characteristics in the Navy (education, age, race, education, etc.) so that exact comparisons could be made.

There has been quite a change from the early 1980s. While Navy personnel are still more likely than civilians to smoke, the differences are now relatively small.

## Smoking: Marine Corps vs. Civilians

- Research Triangle Institute provides comparisons standardized for sex, age, education, race/ethnicity, and marital status
  - 1994 data for civilians and 1995 data for Corps
  - Smoking in the last 30 days
- Marine Corps shows higher rates than civilians
  - 18 to 25 years of age
    - 45% Marine corps and 36% civilian
  - 26 to 55 years of age
    - 37% Marine Corps and 28% civilian

How does the smoking behavior of Marines compare with the smoking behavior for all civilians? The best analysis we found was one by the Research Triangle Institute. Questionnaires in 1994 and 1995 asked the same question (smoking in the last 30 days) of Navy and civilian personnel. Analysts at Research Triangle Institute then standardized the civilian data, making them comparable to the demographic characteristics in the Navy (education, age, race, marital status, etc.) so that exact comparisons could be made.

There has been quite a change from the early 1980s. While Marines are still more likely than “comparable” civilians to smoke, the differences are now considerably smaller. The differences in smoking rates between Marines and civilians are statistically significant for both age groups.

### Data Sources

Marine Corps data from DoD Survey of Health Related Behaviors Among Military Personnel, 1995 (3,956 Marines participated in the survey).

Civilian data from the National Household Survey on Drug Abuse, 1994 (12,280 civilians were surveyed).

## Navy Recruits

We turn next to an analysis of the pre-service smoking behavior of Navy recruits.

## Student Health Inventory Profile for Navy Recruits at Bootcamp

- Started August 1995. Administered after Moment of Truth at RTC, GL
- Extensive medical histories plus many behavioral/attitudinal questions
  - Frequent trouble sleeping?
  - Depression or excessive worry?
  - Problems getting along ...?
  - Past counseling for problems?
- Pre-service tobacco and alcohol use information

We received the Student Health Inventory Profile (SHIP) data from Recruit Training Center, Great Lakes (RTC, GL). It contains a very rich source of information on medical histories, behaviors and attitudes, and pre-service tobacco and alcohol use.\*

Using social security numbers, we matched the information on this survey with our personnel files.

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\*The survey was developed to automate the process of obtaining medical record forms for each recruit. Information from the questionnaires is scanned in and the forms are created from the information on the questionnaires.



## Pre-Bootcamp Tobacco Use

- Over 65,000 surveys report 37% of Navy recruits use tobacco (late '95 to early '97)
  - 31% smoke
  - Another 3% smoke and chew
  - 3% chew only
- Of those who smoke
  - 1 in 8 smokes two or more packs/day
  - Of those who started smoking before age 12, 1 in 3 smokes two or more packs per day

These Navy bootcamp survey results are from August 1995 through December 1996. A high proportion of recruits (37 percent) report pre-service smoking.

From the survey, we found that heavy smokers are especially concentrated among those who started smoking when they were very young. Of those who started smoking by age 12,\* one in three smokes two or more packs per day.

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\* Slightly over 8 percent of the Navy recruit smokers started smoking *before* age 12.

## Smoking and Bootcamp Policies

- None of the services allow recruits to smoke at bootcamp
  - Navy since '91, AF since '88, MC since '70s
- CNRC 1997 Navy Recruit Survey
  - Given to those in the DEP
  - 90% “planned” to stop smoking before bootcamp

The Marine Corps has prohibited smoking at bootcamp since the late 1970s. While we are uncertain when the Army stopped allowing recruits to smoke at bootcamp, we are fairly certain it was in the late 1980s or early 1990s. In this period, all the services were talking about “smoke-free” militaries by the year 2000.

Each year Navy Recruiting Command gives a survey to recruits in the delayed entry program (DEP).<sup>\*</sup> Recruits seem aware that they will not be able to smoke at bootcamp, and most who smoke report that they are planning to stop smoking before bootcamp. While we do not know how many did stop, our findings about pre-service smoking behavior and bootcamp attrition suggest that few did.

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<sup>\*</sup>Most recruits enter the military through the delayed entry program. They sign an enlistment contract and agree to enter the military at a specific date, sometime within the next 12 months.

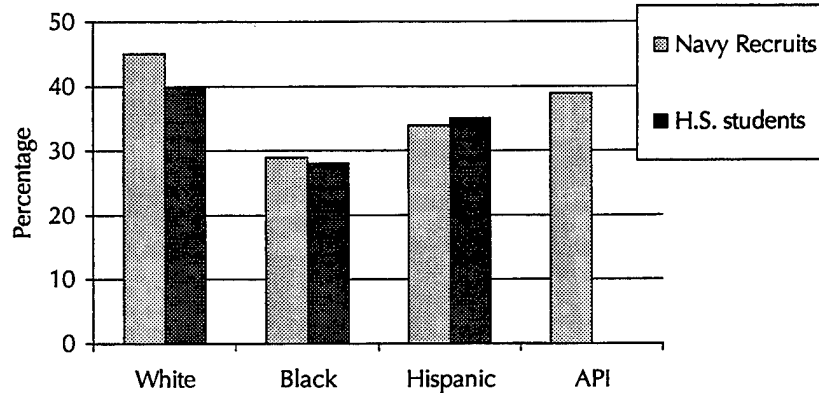
## Comparing Navy Recruits with Civilian Population: Smoking Behavior

- Not the same question or the same ages
  - H.S. students
    - Did you smoke in the past month?
  - Navy recruits
    - Do you smoke?
    - Packs per day on average
      - Choices were 1, 2, or 3 or more
- Navy recruits are more likely to smoke than civilians
- Navy recruits and civilians have similar smoking patterns
  - By gender and race/ethnic background

Unfortunately, we do not have either the same question about smoking behavior or the same ages for our comparisons of smoking behaviors of Navy recruits and civilians. Thus, direct comparisons of the percentages of smokers are not possible. However, our analyses of other surveys suggest that Navy recruits are more likely to smoke than civilians of comparable ages.

What we do want to show on the next two slides, however, is something different. We are intrigued by the similar patterns in smoking behavior among civilians and Navy recruits when the data are divided by gender and race/ethnic background.

## Male Smokers : 1996-7



Source: FY 1996 Navy Recruits (SHIP survey) and Center for Disease Control (Youth Risk Behavior Survey, 1997). No civilian data are available for APIs.

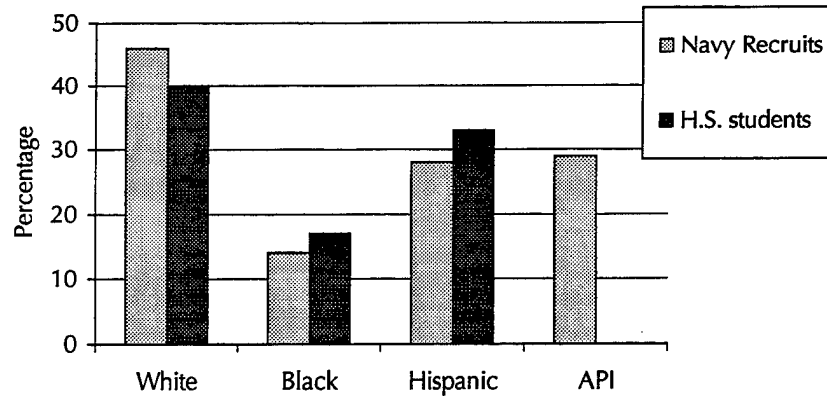
Here we show the percentage of male smokers for Navy recruits and for high school students.\*

We see substantial variation in the smoking percentage among the different race/ethnic groups. There have been several articles recently in the press about the increase in black teenage smoking. While that is true, it is also true that black teenagers (and black recruits into the Navy) smoke at considerably lower rates than whites. We found no civilian data for Asian/Pacific Islanders (APIs).

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\*Remember that these are not quite the same age groups and that the smoking questions were not the same. The patterns of behavior by race/ethnic backgrounds, however, are very similar.

## Female Smokers : 1996-7



Source: FY 1996 Navy Recruits (SHIP survey) and Center for Disease Control (Youth Risk Behavior Survey, 1997)

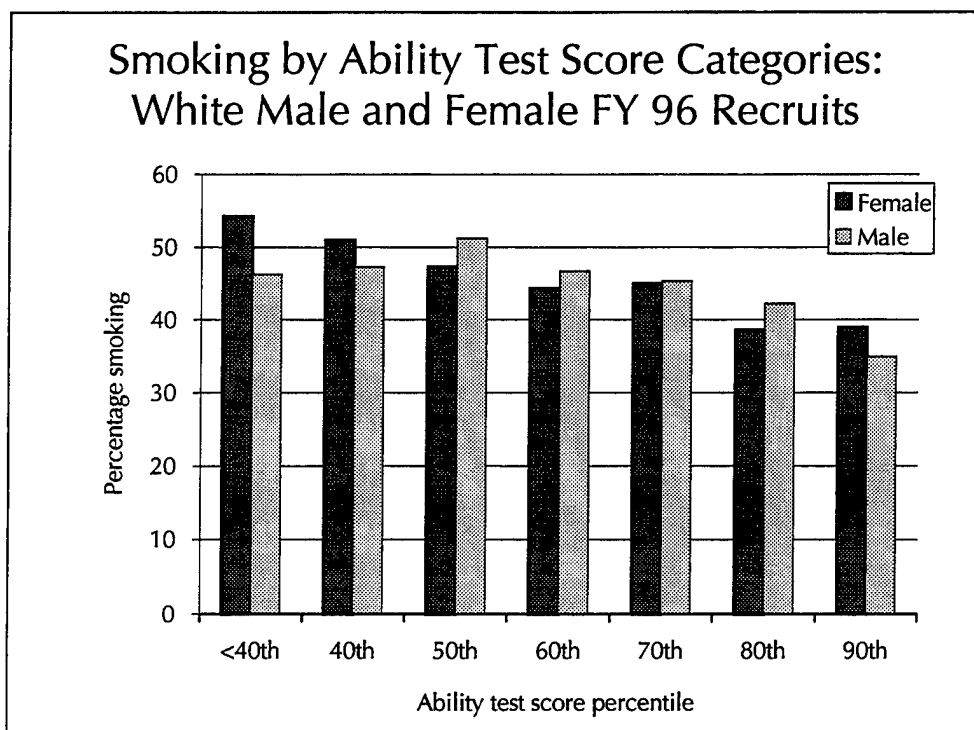
The race/ethnic differences in smoking propensities are even stronger for women than for men. Young black women are considerably less likely than young white women to smoke. In fact, the smoking percentages for young white men and women are virtually identical,\* while the smoking rates for black women are considerably below those for black men.

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\*For white Navy recruits, 45 percent of men and 46 percent of women smoke. For black Navy recruits, the percentages are 29 percent for men and 14 percent for women. In the civilian high school data, the percentages of smokers are 40 percent of white women and 40 percent of white men. The comparable civilian rates for blacks are 17 percent for women and 28 percent for men.

## Pre-Service Smoking Patterns

Because the smoking behaviors of Navy recruits appear to track data on civilian teenage smoking patterns, we think it is worthwhile to examine these Navy data in somewhat more detail.



Our data show:

- Substantial differences in smoking behavior by race/ethnic status
- Substantial gender differences in the percentages of minority teenagers who smoke
- Few gender differences in the percentages of white teenagers who smoke.

These findings complement findings from a recent federal study.\* Because of gender and race/ethnic differences in smoking behavior, it seemed logical to investigate differences in smoking behavior by ability level separately by gender and race/ethnic category. For this analysis, we have classified all recruits as white or as non-white.

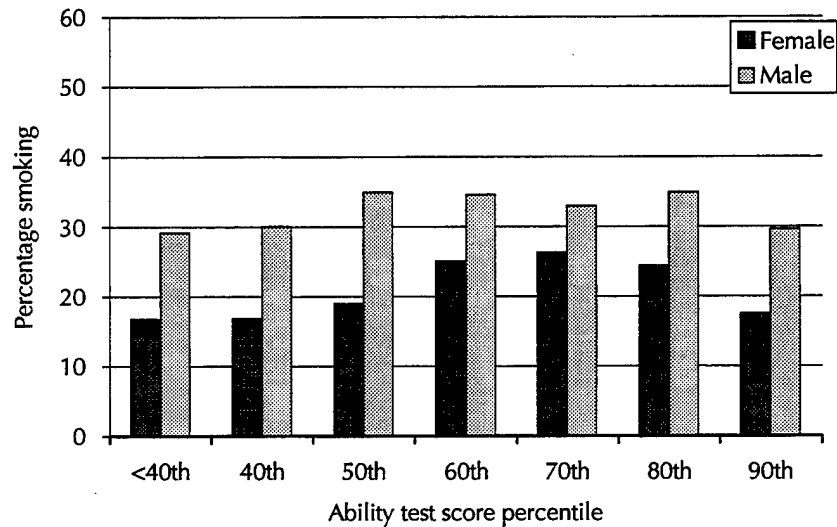
Here we show the percentage of smokers by gender for white recruits who test at different ability levels.\*\* For both men and women, there is a fairly strong negative relationship between the smoking percentage and the test score percentile.\*\*\*

\* See *Tobacco Use Among U.S. Racial/Ethnic Minority Groups: A Report of the Surgeon General*, U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 1998.

\*\*Percentiles are from nationally normed ability test, the Armed Forces Qualification Test (AFQT).

\*\*\* These findings are confirmed in logistic regressions. Controlling for gender, race-ethnic background, educational background, and age at entry into the Navy, the relationship between smoking and ability test score percentiles is negative. The parameter estimate for AFQT percentile score is statistically significant at the 1-percent level. The derivative of the conditional mean function for the AFQT is -.0007. This means that a 10-percentage-point increase in the AFQT test score is associated with a .7-percentage-point reduction in the probability of smoking. Thus, although statistically significant, the effect is not large.

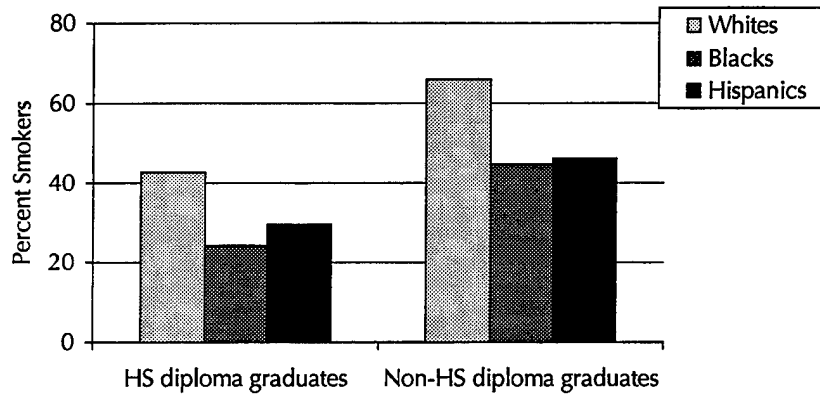
### Smoking by Ability Test Score Categories: Non-white Male and Female FY 96 Recruits



The results for non-white Navy recruits are more mixed, and there does not appear to be much difference between smoking behaviors for men and women who test at different ability levels. A possible exception is found for those who test at the 70th percentile and above. Particularly for women, the relationship at that point appears negative, with proportionally fewer smokers as the test score percentile increases to the 80th and the 90th percentile.



## Smokers by Educational Background

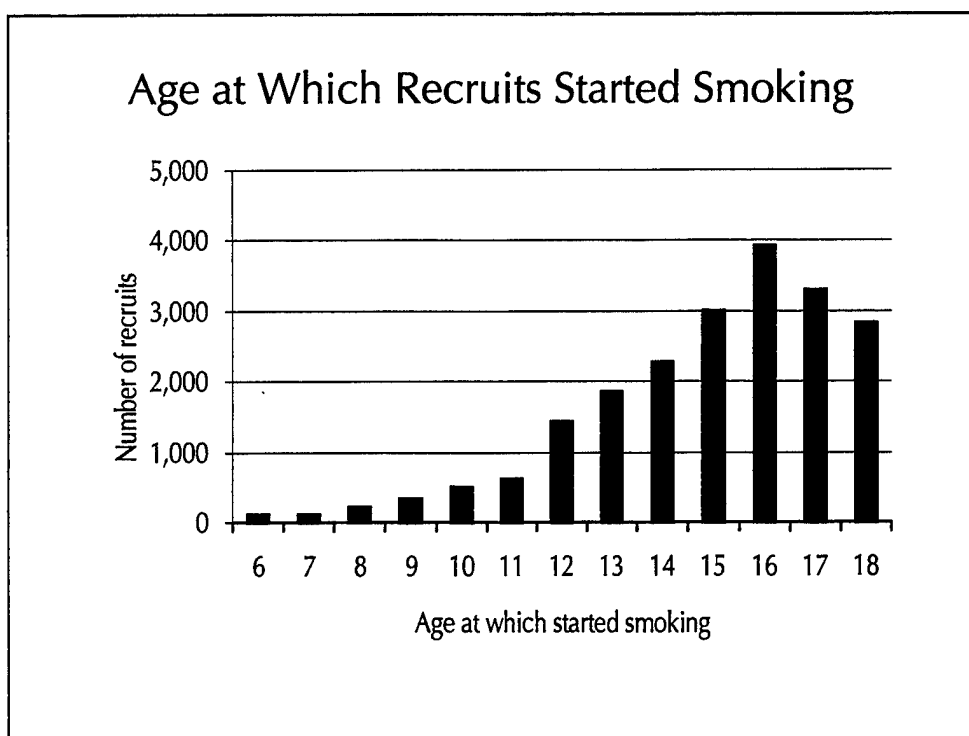


Source: FY 1996 Navy Recruits (SHIP survey). Non-HS diploma graduates include those with diplomas given by alternative means (primarily GEDs) and HS dropouts. Most are GEDs. Note: HS diploma graduates exclude adult-education and one-semester-college recruits.

About 95 percent of Navy recruits are high school diploma graduates; the other 5 percent are mainly holders of General Education Diplomas (GEDs), although there are a few high school dropouts.

Much more powerful than test scores is the effect of educational background on smoking behavior. High school graduates of every race/ethnic group are less likely to smoke than are those who get their high school degree through a test (GED) or those who did not get a high school degree.\*

\*Logistic regressions confirm these findings. Controlling for gender, race-ethnic background, ability test score percentage, and age at entry into the Navy, the relationship between smoking and having a regular high school diploma is strong and positive. The parameter estimate for a high school diploma graduate is statistically significant at the 1-percent level. The derivative of the conditional mean function is .122. This means that high school graduation is associated with a 12.2-percentage-point drop in smoking probability. [In this regression, high school diploma graduates exclude adult-education and one-semester-college recruits.]

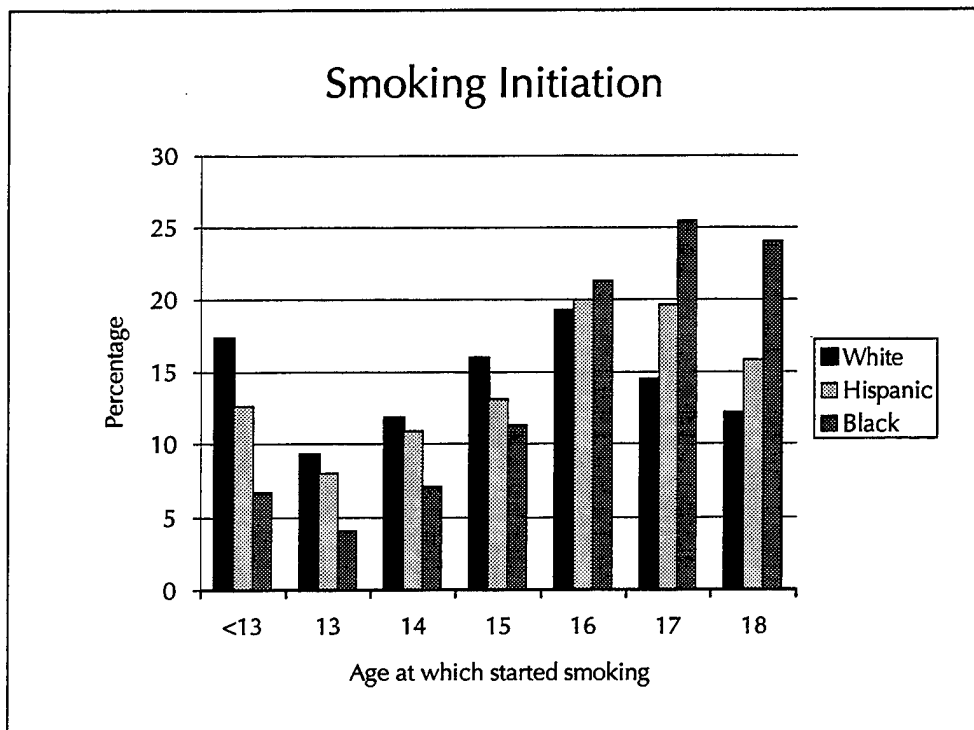


We now turn to the age at which recruits started to smoke. A very large effort is under way in the United States to curb youth smoking. We believe that these data gathered in the SHIP survey provide the strongest evidence we have seen that curbing youth smoking may actually curb smoking. For all teenagers, the onset of smoking peaks at age 16. Fewer recruits started smoking at age 17 and even fewer at age 18. Although a few hundred recruits enter the Navy at age 17, the overwhelming majority of Navy recruits are 18 years or older.\* Thus, we have restricted this look to recruits who said they began smoking before the age of 19 to obtain a non-biased look at when these recruits began smoking.

Although the largest numbers of recruits begin to smoke at age 16, there are still substantial numbers who begin smoking at 17, 18, 19, 20, and 21 years of age.

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\*We have omitted the responses for those who reported they began smoking at 19 years or older because that information would be misleading. Individuals who begin bootcamp at 19 years or older are not represented in the proportion that they are in the population at large. In technical terms, we say the data are truncated.



Here we look at smoking initiation by race/ethnic background for all recruits who reported they started smoking at age 18 or younger. For each race/ethnic group, the distribution of smoking initiation age in the figure sums to 100 percent. The figure is illuminating because it shows substantial differences by race/ethnic affiliation.\*

White teenagers (and preteens) clearly begin smoking at younger ages than other population groups. For teens who were smoking by age 18, the percentages that began smoking by 15 years of age were as follows:

- 54.3 percent for white teens
- 44.6 percent for Hispanic teens
- 29.2 percent for black teens.

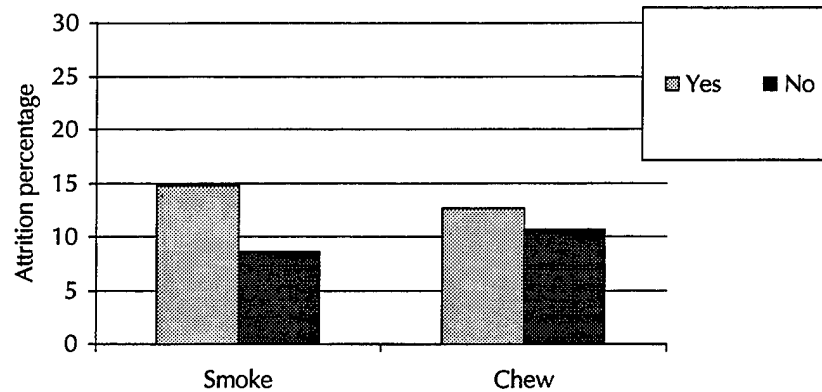
These data confirm the preliminary findings reported in *Tobacco Use Among U.S. Racial/Ethnic Minority Groups: A Report of the Surgeon General*, U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 1998.

\* We use the SHIP data for Navy recruits who entered in FY 1996 and restrict the observations to those who reported that they began smoking at age 19. In these data, there are 11,162 white, 1,324 Hispanic, and 1,608 black recruits who reported that they began smoking between the ages of 6 and 18.

## Pre-Service Smoking and Navy Bootcamp Attrition

We turn next to an analysis of the pre-service smoking behavior and bootcamp performance. Specifically, we will look at those who are not successful -- those who attrite from the Navy at bootcamp.

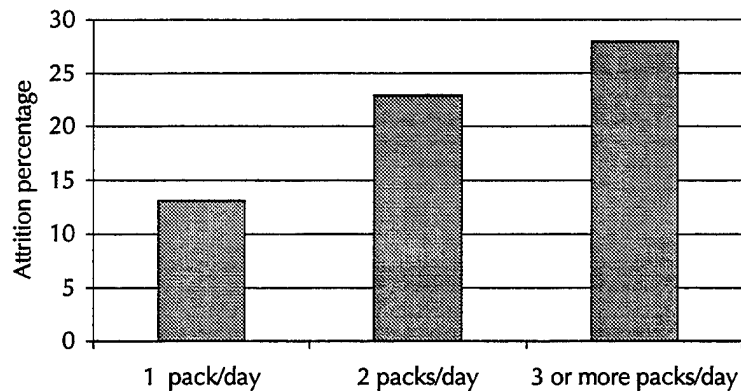
## Navy Bootcamp Attrition: Tobacco Users



The bootcamp attrition results, by pre-bootcamp smoking and non-smoking behavior, are very sharply delimited. While we have many other indicators that sharply delineate attrition behavior, most of the high-attrition results are for relatively small categories of recruits (high school non-graduates, very low scores on intelligence tests). We are not aware of any results that create such a sharp difference between large categories of recruits: the 37 percent who were pre-service smokers and the 63 percent who were not. These attrition findings are also supported by multivariate analyses that control for other characteristics and estimate the independent effect of smoking behavior on attrition. They are very powerful findings.

There are only small differences in bootcamp attrition rates between recruits with pre-service chewing tobacco habits and recruits without such habits.

### Navy Bootcamp Attrition: Smokers by Packs per Day



Bootcamp attrition rates are also sharply delimited by the number of packs of cigarettes per day that the recruit reported smoking before bootcamp. For recruits who reported smoking two packs a day (12 percent of recruits), the bootcamp attrition rate was 23 percent; for those who reported smoking three or more packs per day (1 percent of recruits), the bootcamp attrition rate was 28 percent. *If* the Navy could recruit its accessions entirely from the non-smoking population and *if* the current attrition behavior continued, about 1,500 more recruits would have graduated from bootcamp in the 15-month period.

## Navy Bootcamp Attrition

- FY96 bootcamp attrition rate was 12.5%
  - 10.5% for top quality recruits (Smart and High School Diploma Graduates)
  - 8.6% for non-smokers
- Bootcamp attrition is expensive
  - What can be done in the DEP to encourage quitting smoking *before* bootcamp?
  - What more can we do in bootcamp to reduce the attrition of pre-service smokers?

This slide simply reinforces the powerful findings about the relationship between pre-service smoking and bootcamp attrition. About two-thirds of recruits are top-quality recruits (by test scores and educational background) and about two-thirds are non-smokers. While there is clearly some overlap, they are not the same two-thirds of recruits. That the non-smokers who reflect all test score and educational backgrounds have considerably lower bootcamp attrition rates than do our top-quality recruits is a startling finding.\*

Since every recruit who attrites at bootcamp must be replaced, bootcamp attrition is very expensive. What can be done to reduce the bootcamp attrition of smokers? We will return to this question later in the briefing.

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\*This definition of top-quality recruits is a DoD definition used by all the services.

## Is The Glass Half Empty or Half Full?

Of the 24,000 smokers, 85 percent successfully graduated from bootcamp,



they went smoke-free for 2 months

But, what then?

- Do they resume smoking in the fleet?

- Do they have dental follow-ups?

- How does the Navy compare to:

  - Civilian smoking cessation programs?

  - Other service forced cessations in bootcamp?

As with many topics, there is another way to look at these data.

Among other things, the Navy runs a mandatory smoking-cessation program at bootcamp. Eighty-five percent of the smokers in this program went smoke-free for 2 months. How do these results compare with other efforts?



- Civilian Smoking-Cessation Program
- Some Findings from the Air Force

Let's turn now to a quick review of the relative successes of civilian smoking-cessation programs as well as some findings from the Air Force.

## Civilian Smoking-Cessation Programs: Summary of Findings

- Most large-scale smoking-cessation efforts have not been successful
  - Some, though, produced a 2% - 3% difference between treatment and control groups
  - Work only on light and moderate smokers
- Expensive, intensive smoking-prevention efforts generally get success rates of 30% - 40%
  - Results variable and all “volunteers”
  - Using nicotine replacement typically gets best results

Examples of large-scale smoking-cessation efforts include those by communities to reduce smoking. These efforts usually focus on large-scale information campaigns that detail the health risks associated with smoking and often designate a particular day as the “stop-smoking” day. We were unable to find much good information about the success of such programs. What we found indicated that most efforts were not very successful, but some did appear to have a small, positive impact on smoking behavior.

Expensive, intensive smoking-prevention efforts often include a stay in a smoke-free environment, as well as considerable focus and support on the effort to stop smoking. Clearly, these efforts are only tried by individuals who are strongly motivated to stop. Success rates after one year of 30 to 40 percent are not uncommon. Efforts that include nicotine replacement (gums, patches, or pills) have generally been more successful.

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Source: This information is largely taken from *Efficacy of Forced Smoking Cessation and an Adjunctive Behavioral Treatment on Long-Term Smoking Rates*, by Robert C. Klesges, Ph.D. (University of Memphis Prevention Center), C. Keith Haddock, Ph.D. (University of Missouri, Kansas City), Harry Lando, Ph.D. (University of Minnesota), and G. Wayne Talcott, Ph.D., U.S.A.F. Surgeon General's Office, 1998.

## Involuntary Quitting: Enforced Bans on Smoking

- Where are they?
  - Some hospitals
  - Some prisons
  - Bootcamps in all the services
- How well do they work?

While many restaurants, public buildings, and places of work have banned smoking, these are temporary bans. When individuals leave the setting, they are able to resume smoking.

Situations that do not permit smoking for long time periods include hospitals, prisons, and bootcamps in all military services.

How well do these bans work in reducing smoking after the individuals leave the environment where smoking is banned? We have no information from the Navy, but let's turn to some findings from the Air Force.\*

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\*We believe these are the only findings to date available for the long-term effects of such smoking bans.

## Air Force Recruits

- Study funded by National Institutes of Health
  - Researchers at University of Memphis, University of Minnesota, and United States Air Force (Surgeon General)
  - All Air Force recruits from Aug 95 to Aug 96 (25,966)
- Three main components
  - Behavior health risk questionnaire at start of bootcamp
  - “Treatment group” had 50-minute program in 5th week of 6-week bootcamp
    - Commitment cards for those intending to quit
  - Follow-up one year after bootcamp

The National Institutes of Health funded this study for all Air Force recruits in 1995-6.\* The study had three main components: the health risk questionnaire at the onset of bootcamp (this appears similar to the Navy questionnaire discussed earlier), a very short program toward the end of bootcamp for a group of the pre-service smokers that included information on the short- and long-term effects of smoking, and one-year follow-up after bootcamp.

Individuals were located (address and phone number) at the one-year follow-up by the Air Force's World Wide Locator. Surveys were then mailed to participants to ascertain current smoking behavior.\*\* Those who had not completed bootcamp or who had left the Air Force before the one-year point were not surveyed. The goal was to survey at least 95 percent of pre-service smokers still in the Air Force and 65 percent of the non-pre-service smokers still in the Air Force (achieved rates were 96 percent and 66 percent ).

Prior to bootcamp, 28.9 percent of the Air Force recruits reported that they had smoked at least one cigarette/day.

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\*This information is largely taken from *Efficacy of Forced Smoking Cessation and an Adjunctive Behavioral Treatment on Long-Term Smoking Rates*, by Robert C. Klesges, Ph.D. (University of Memphis Prevention Center), C. Keith Haddock, Ph.D. (University of Missouri, Kansas City), Harry Lando, Ph.D. (University of Minnesota), and G. Wayne Talcott, Ph.D., U.S.A.F. Surgeon General's Office, 1998.

\*\*We believe this information can be obtained both more cheaply and more reliably by using information from military dentists.

## Air Force Results: Smoking Status at 1-year Follow-up

- 18 percent of pre-service smokers were still smoke-free. Better results for
  - Light smokers (lower Fagerstrom dependence scores)
  - Those intending to remain non-smokers
  - Those who had the 50-minute smoking-cessation intervention versus control group (general health video)
- Study authors argue
  - Results about 9 times stronger than other large-scale efforts
  - Smoking bans appear extremely cost-effective

While the study contains no information on the bootcamp attrition for pre-service smokers and non-smokers that we can compare with our Navy findings, the study contains extremely valuable information on smoking histories after bootcamp for personnel who remained in the Air Force.

The authors report that 18 percent of pre-service smokers (those still in the Air Force) were still smoke free at the one-year point. The strongest results were for the lighter pre-service smokers, the pre-service smokers who had reported in the 5th week of training that they intended to try to remain smoke-free, and those who had had the 50-minute intervention.

This success rate is considerably larger than success rates of the large-scale community efforts discussed earlier (18 percent versus 2 to 3 percent). Indeed, the success rate is more in the ballpark of the expensive, intensive intervention efforts that achieved one-year success rates of 30 to 40 percent.

## Air Force 1-Year Follow Up Results (Cont'd)

- Good News: the pre-service regular smokers who stopped
- Bad News: High levels of smoking initiation in first year of Air Force service
  - 8% of the pre-service "never smoked" now smoked
  - 26% of pre-service "experimental smokers" smoked
  - 43% of pre-service "ex-smokers" smoked
- Total smoking proportion actually increased
  - At 1-year point higher proportion smoked than at entry into Air Force

The last slide detailed the "good news" from the analysis, namely, the 18-percent drop in smoking from the pre-service smokers.

The bad news is that so many other airmen began smoking in their first year of service that the overall proportion of smokers actually increased.

As the authors of the study suggest, "clearly, future interventional efforts should be directed not only at smoking relapse among those who smoked before BMT, but at smoking prevention in those who had not regularly smoked prior to BMT."\*

Given that almost 200,000 young people enter the military each year, the military provides a real "test-bed" for what works and what doesn't work in deterring people from smoking. About 50 percent of smokers start before age 18 and almost 90 percent start by age 21.\*\* Let's turn now to some ideas about how we might use information from military recruits to help us understand more about youth tobacco use.

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\**Efficacy of Forced Smoking Cessation and an Adjunctive Behavioral Treatment on Long-Term Smoking Rates*, 1998 (full reference given in first footnote on page 33).

\*\*See M. K. Kreuter and K. E. Powell, "Psychosocial Predictors of Smoking Among Adolescents," *Morbidity Mortality Weekly Report*, Vol. 36, 1987:1S-2S.

## Some Ideas for Further Initiatives

We now turn to some ideas for future research.

## National Attention on Youth Smoking

- Many initiatives to curb youth smoking
  - Unclear if there will be any Federal legislation
  - State settlements with tobacco companies
- Opportunity for the services to identify cost-effective smoking-cessation activities
  - Verify “cold turkey” - extensions to initial skill training
  - Relate physical fitness scores to smoking behavior
  - Try nicotine replacement strategies, in the DEP and at bootcamp
  - Try other behavioral/motivation techniques

Given the country's attention on youth smoking, a study to address the smoking behaviors of the almost 200,000 youth who enter the military each year through smoke-free bootcamp environments provides a unique opportunity to really learn what works and what doesn't work to reduce youth smoking.



## New Attention on Smoking Behaviors for Minorities

- 1998 Report from U.S. Surgeon General
  - African Americans
  - American Indians and Alaska Natives
  - Asian Americans and Pacific Islanders
  - Hispanics
- Behavior appears different from majority
  - More smoking initiation in their twenties
    - For example, recent data shows 10-percentage-point increase in smoking for African Americans (from 20-24 yrs to 25-29 yrs)
  - Report cites “paucity of research” on tobacco initiation behavior for minorities

The report states:

Although much of the original research on psychosocial factors that influence tobacco use reflects general processes that may apply to racial/ethnic populations, documenting such generalizability requires further research.

The initiation of tobacco use and early tobacco use among members of the various racial/ethnic seems to be related to numerous categories of variables—such as socio-demographic, environmental, historical, behavioral, personal, and psychological—although the predictive power of these categories or of specific risk factors is not known with certainty because of the paucity of research.

Data on pre-service smoking behavior for Navy bootcamp accessions should be able to shed considerable light on these questions. In this briefing, we have presented illustrations of the kinds of information that are available.

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\*Source: *Tobacco Use Among U.S. Racial/Ethnic Minority Groups: A Report of the Surgeon General*, U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 1998.

## Bootcamps Provide Unique Setting for Testing Intervention Strategies

- Pre-service smoking information
- Ban on smoking during bootcamp
- Captive, young audience. Most Navy recruits report they want to stop smoking
  - Can we reduce the bootcamp attrition for smokers?
  - Can we keep these sailors as non-smokers?
- Relatively easy follow-up on smoking behavior
  - Yearly dental checkups
- Inexpensive method for country to test smoking-cessation strategies

Most experiments to track behavior require large start-up costs. We are extremely fortunate that most of the infrastructure needed to track smoking behaviors for young military personnel are already in place.

**Pre-service smoking information is currently collected** by the Navy and the Air Force and could be collected by all the services. The Navy at least uses the questionnaire designed to cost-effectively automate the Medical Records production process. The **smoke-free treatment effects vary** as the service bootcamps are from 6 to 12 weeks. Since all military personnel are required for readiness purposes to have an annual dental checkup, we have an **easy, objective follow-up for post-bootcamp smoking**.

Moreover, we maintain longitudinal files on our military personnel: we know where they've been, what they've done, etc. Adding information on who went through what smoking cessation intervention strategy to these files should be straightforward.

In short, we have the opportunity to try various educational/informational strategies, as well as nicotine replacement techniques. Since we have the demographic data, we can further identify which strategies appear to work best for which groups.

Most of all, though, we have the advantage of large numbers:

- About 200,000 new recruits each year
- About 70,000 young people each year who smoked prior to entry
- About 20,000 young people who will start smoking in their first year in the military.

## Smoking Behavior (and Initiation) after Bootcamp

- Pre-service smoking information for new entrants
  - Can identify pre-service non-smokers
- Dental checkups over time will “pick up” new smokers
  - Finding out when people stop, start, re-start
- No civilian data compare for the richness of longitudinal information

As the slide shows, with dental exam information, we can monitor information on smoking behavior for everyone in the services.

## What's Needed?

- Ability to track recruits moving through the fleet
  - Tie intervention strategies to smoking behavior
  - SSN by SSN
- With dental checkups for all sailors, monitor smoking initiation in the fleet
  - Target commands with higher than average “new smokers” for various intervention strategies
  - Monitor how the strategies work
- Money for increased initiatives and money for evaluative efforts of those initiatives

This slide summarizes much of what we've already said.

We don't know what interventions work to help young people refrain from starting smoking or to help them quit. To figure out what works, we need data from a large set of experiments. Recruits into the military can provide such data. The missing link so far is the money for increased initiatives and money to study the effects of such initiatives.

## Backup: Data Sources

- Information in this briefing on demand for cigarettes is from:  
"Cigarette Taxes and Teen Smoking: New Evidence from Panels of Repeated Cross-Sections," working paper by William N. Evans, Department of Economics, University of Maryland, College Park, MD, and Lynn X. Huang, NORC, Washington, DC, 15 April 1998.  
"Policy Watch: Alcohol and Cigarette Taxes," by Michael Grossman, et al., *The Journal of Economic Perspectives*, Fall 1993: 211-222.
- The Air Force information is from:  
*Efficacy of Forced Smoking Cessation and an Adjunctive Behavioral Treatment on Long-Term Smoking Rates*, by Robert C. Klesges, Ph.D. (University of Memphis Prevention Center), C. Keith Haddock, Ph.D. (University of Missouri, Kansas City), Harry Lando, Ph.D. (University of Minnesota), and G. Wayne Talcott, Ph.D., U.S.A.F. Surgeon General's Office, 1998.

We list our data sources on this backup slide.

## Backup: Price of Cigarettes

- Increasing the price of cigarettes reduces demand for two reasons
  - Some people quit entirely (about 1/2 of effect)
  - Other people smoke less (about 1/2 of effect)
- Some research suggests younger smokers more price-responsive than older smokers

Although proposed legislation in 1998 to raise the price of cigarettes by a federal tax of up to \$1.50 per pack did not pass in the Congress, various states have increased the price of cigarettes fairly substantially. There is some hope that youth tobacco use will be reduced as young people are believed to be relatively price-responsive. The tobacco settlement that the cigarette companies recently reached with several large states also contains various initiatives designed to reduce youth tobacco use.

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